REMARKS

Claims 1-17 are pending in this application. Claims 1-8 are currently rejected and Claims 9-17 are new. Claim 3 is currently amended to correct a grammatical error.

Applicants submit the following remarks and respectfully request reconsideration of the application.

Rejection Under 35 U.S.C. §103

Claims 1-8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 6,629,152 (Kingsbury) in view of U.S. Patent 4,901,230 (Chen et al.).

Regarding Claim 1,

Claim 1 recites:

1. A processing system for performing addition and subtraction within limits upon a shared value comprising:

means for performing a first uninterruptible operation upon the shared value stored in an affected reservation location, the first uninterruptible operation using an operand;

means for comparing a resulting value of the first uninterruptible operation stored in the affected reservation location to an upper value and a lower value to determine if the resulting value is within a range defined by the upper value and the lower value that can be changed;

means for performing a second uninterruptible operation to restore the affected reservation location if the resulting value of the first uninterruptible operation is not within the range defined by the upper value and the lower value;

means for reporting a failure if the resulting value of the first uninterruptible operation is not within the range defined by the upper value and the lower value;

means for performing a third uninterruptible operation to update an actual value location if the resulting value of the first uninterruptible operation is within the range defined by the upper value and the lower value;

means for performing a fourth uninterruptible operation to update an unaffected reservation location if the resulting value of the first uninterruptible operation is within the range defined by the upper value and the lower value; and

With regard to Claim 1 the Examiner admits:

> Kingsbury is silent with reference to teaching a means for comparing a resulting value of the first interruptible operation stored in the affected reservation location to an upper value and lower value to determine if the resulting value is within a range defined by the upper value and lower value that can be changed; and means for reporting a failure if the resulting value of the first uninterruptible operation is not within the range defined by the upper value and lower value.

and cites Chen et al. as teaching these limitations. The Applicants traverse the combination of the teachings of Chen et al. and Kingsbury.

First, in the teachings of Kingsbury there is never any need to compare the result of the first uninterruptible operation to a lower value, such as the bottom limit of a "*range.*" In Kingsbury, there is never any need to compare the result of the first uninterruptible operation to a lower value because those teachings cited by the Examiner as teaching the first uninterruptible operation (e.g., AFADD()) always involve incrementing (i.e., increasing) a variable by a value of one. See for example, the second line of pseudo code in Table 1, and the discussion at Col. 9 lines 42-53 of Kingsbury. This text and pseudo code teach "[t]he AFADD() operation returns the present value of a memory location and increments it to a new value..." Thus, even if one were to assume for the sake of argument that the teachings cited by the Examiner did teach the first uninterruptible operation recited in Claim 1, this operation could never generate "*a resulting value*" that for the first time violated a "*lower limit.*" Thus, there would be no reason to compare the "*resulting value*" with a "*lower limit.*"

As such, there is no reason to combine the teachings of Chen et al. with those of Kingsbury, and a person of ordinary skill in the art would not think to combine those

teachings of Chen et al. that include a lower limit with the teachings of Kingsbury. For at least these reasons, the Applicants believe that Claim 1 is allowable.

While there are other operations in Kingsbury that involve subtraction and thus hypothetically could violate a lower limit, none of these operations produce the "*resulting value*" as recited in Claim 1. For example, in Kingsbury there are no subtraction operations whose result is compared with limits in order to send a failure message.

Further, in Kingsbury, there is never any need to compare the result of any uninterruptible operation to a lower limit because those values suggested by the Examiner to teach the "*the shared value stored in an affected reservation location*" can never be less than a lower limit of zero (which is the lower limit the Examiner suggests is implied in Kingsbury). Specifically, even if for the sake of argument one were to assume that the parameter "unreserved" (Table 1 line 2) taught the shared value on which the "first uninterruptible operation" operates, the parameter "unreserved" can never become negative within the teachings of Kingsbury.

The "unreserved" parameter cannot become negative because, as taught in Col. 12 lines 40-45, this parameter is only reduced by an amount by which actual messages have been read from the mailbox, e.g., the value of "freed." Thus, if 3 messages were present prior to reading messages, the value of "freed" could be no more than 3 and unreserved could not be reduced by more than 3. Therefore, the value of "unreserved" would always be greater than or equal to zero.

Thus, even if zero were inferred to be a lower limit (an assumption the Applicant traverses), the value of "unreserved" is maintained at values of zero or more by independent logic and without the need for comparisons between the value "unreserved"

and zero. Therefore, there would be no benefit to combining the teachings of Chen et al. with those of Kingsbury in order to add a comparison with a lower limit to the teachings of Kingsbury. For at least these reasons, the Applicants believe that Claim 1 is allowable.

Finally, the Examiner states "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Chen and Kingsbury because the teaching of Chen would improve the system of Kingsbury by providing a general purpose multiprocessor system for multitasking applications involving vector processing..." The Applicants traverse this statement. First, as argued above, the teachings of Kingsbury are not benefited by inclusion of a comparison with a lower limit as taught in Chen et al.

Second, it is the Applicants position that the motivation suggested by the Examiner is achieved by Kingsbury alone and thus cannot serve as a motivation to combine Kingsbury with other art, such as Chen et al. Specifically, Kingsbury alone is taught to be a multiprocessor system for multitasking applications (see Col. 4 line 66 through Col. 5 line 9). This teaching is independent of Chen et al. It is not clear how the proposed combination would further these preexisting benefits of Kingsbury, as suggested by the Examiner, e.g., the Examiner has not shown how a combination of a range comparison and the teachings of Kingsbury would improve Kingsbury. The only benefit suggested by the Examiner is one achieved without requiring the suggested combination, and therefore cannot be used to motivate the combination.

For the above reasons, the motivation for combining the teachings of Kingsbury and Chen et al., as suggested by the Examiner, would not cause a person of ordinary skill

in the art to make such a combination. It is, therefore, the position of the Applicants that Examiner has failed to make a prima facie case for rejection under §103(a).

Regarding Claims 2-8,

It is the position of the Applicants that Claims 2-8 are allowable for at least the reasons discussed above with respect to Claim 1.

Regarding New Claim 9,

Claim 9 recites:

> *9. A method of performing subtraction or addition within limits, the method comprising:*
> *receiving an operand from a processing thread;*
> *performing a first uninterruptible operation upon an affected reservation location, the affected reservation location including a first instance of a shared first value, the first uninterruptible operation being configured to generate a second value by subtracting the operand from or adding the operand to the first instance of the shared first value;*
> *comparing the generated second value in the affected reservation location to one or more limit values stored in one or more limit locations;*
> *performing a second uninterruptible operation to restore the shared first value in the affected reservation location if the second value is not within any of the one or more limit values;*
> *reporting a failure if the second value is not within any of the one or more limit values;*
> *performing a third uninterruptible operation to update a second instance of the shared first value stored in an actual value location if the second value is within the one or more limit values, the actual value location being a memory location shared by a plurality of processing threads; and*
> *performing a fourth uninterruptible operation to update a third instance of the shared first value stored in an unaffected reservation location if the second value is within the one or more limit values.*

Support for the limitations of Claim 9 can be found at the following locations, among others, within the specification:

"*receiving an operand from a processing thread*"; at Claim 3 and page 3 lines 5-7 (page and line numbers refer to the clean version of the specification filed 04-15-05 and entitled "Appendix A");

"performing a first uninterruptible operation upon an affected reservation location (at Claim 3, page 3 lines 16-24), *the affected reservation location including a first instance of a shared first value* (at Claim 3), *the first uninterruptible operation being configured to generate a second value* (referred to as "resulting value" in Claim 3) *by subtracting the operand from or adding the operand to the first instance of the shared first value,"* (at Claim 3, page 3 lines 16-24).

comparing the generated second value in the affected reservation location to one or more limit values stored in one or more limit locations; (Claim 3)

performing a second uninterruptible operation to restore the shared first value in the affected reservation location if the second value is not within any of the one or more limit values; (Claim 3)

reporting a failure if the second value is not within any of the one or more limit values stored in the one or more limit locations; (Claim 3)

performing a third uninterruptible operation to update a second instance of the shared first value stored in an actual value location if the second value is within the one or more limit values, the actual value location being a memory location shared by a plurality of processing threads; and (for teaching within the specification that the actual value location and the affected and unaffected reservation locations each start with a stored instance of the shared first value see page 9 final paragraph, and the example discussed on page 11.)

performing a fourth uninterruptible operation to update a third instance of the shared first value stored in an unaffected reservation location if the second value is within the one or more limit values. (Claim 3)

The Applicants believe that Claim 9, and those claims that depend therefrom, are allowable for at least the following reasons:

1) The operand taught in Kingsbury is a fixed value of "1" according to Table 1 and the associated discussion and is, thus, not received from a processing thread;

2) Kingsbury does not teach that the value added or subtracted is an operand received from a thread; and

3) Kingsbury does not teach that the third and forth uninterruptible operations are performed on instances of the shared first value.

Regarding New Claim 10,

Claim 10 recites:

10. The method of claim 9, further including reporting a success if the second value is within the one or more limit values.

The Applicants believe that Claim 10 is allowable for at least the reasons discussed above with respect to Claim 9, from which it depends.

Regarding New Claim 11,

Claim 11 recites:

11. The method of claim 9, wherein the one or more limit values consist of an upper limit value and a lower limit value.

The Applicants believe that Claim 11 is allowable for the reasons discussed above with regard to Claim 9 from which it depends, as well as Claim 1.

Regarding New Claim 12,

Claim 12 recites:

12. The method of claim 9, wherein the first uninterruptible operation is configured to generate the second value by adding the operand to the first instance of the shared first value.

The limitations of claim 12 are supported, for example, by the paragraph starting in the middle of page 7 of the specification. The Applicants believe that Kingsbury does not teach that the second value is generated using an operand received from a processing thread.

The Applicants further believe that Claim 12 is allowable for the reasons discussed above with respect to Claim 9 from which it depends.

Regarding New Claim 13,

Claim 13 recites:

13. The method of claim 9, wherein the first uninterruptible operation is configured to generate the second value by subtracting the operand from the first instance of the shared first value.

The Applicants believe that Kingsbury does not teach that the first uninterruptible operation is a subtraction. Specifically, the text suggested by the Examiner as teaching the first uninterruptible operation specifies that the operation in question increases a value.

The Applicants further believe that Claim 13 is allowable for the reasons discussed above with respect to Claim 9 from which it depends.

Regarding New Claim 14,

Claim 14 recites:

14. The method of claim 9, wherein the operand has an absolute value greater than one.

The limitations of Claim 14 are supported in the specification, for example in the first paragraph of page 10.

The Applicants believe that Kingsbury does not teach that the first interruptible operation includes addition of a value greater than one. Specifically, the text suggested by the Examiner as teaching the first uninterruptible operations specifies that a fixed value of "1" is to be added.

The Applicants further believe that Claim 14 is allowable for the reasons discussed above with respect to Claim 9 from which it depends.

Regarding New Claim 15,

Claim 15 recites:

15. The method of claim 9, wherein performing the second uninterruptible operation includes using a negative of the operand.

The limitations of Claim 15 are supported in the specification, for example, at page 11 lines 6-8. The Applicants are unable to find any teaching of the limitations of Claim 15 in the cited art.

The Applicants further believe that Claim 15 is allowable for the reasons discussed above with respect to Claim 9 from which it depends.

Regarding New Claim 16,

Claim 16 recites:

16. The method of claim 9, further including choosing the first affected reservation location on which to perform the first uninterruptible operation, responsive to whether the method is being used to perform a subtraction or addition.

The limitations of Claim 16 are supported in the specification, for example, at page 9 last paragraph. The Applicants are unable to find any teaching of the limitations of Claim 16 in the cited art.

Regarding New Claim 17,

Claim 17 recites:

17. The system of claim 1, further including means for choosing the first affected reservation location on which to perform the first uninterruptible operation, responsive to whether the method is being used to perform a subtraction or addition.

The limitations of Claim 17 are supported in the specification, for example, at page 9 last paragraph. The Applicants are unable to find any teaching of the limitations of Claim 17 in the cited art.

Conclusion

In view of the above remarks, the pending claims in this application are believed to be in condition for allowance, and the Examiner is respectfully requested to allow the pending claims in this application. The Examiner is invited to call Applicants' representative at the number below if he has any questions or if there are remaining outstanding issues.

Respectfully submitted,

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